

MARCY (H. O.)



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## ASPIRATION OF THE KNEE-JOINT.

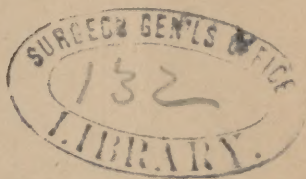
✓ BY

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VICE-PRESIDENT OF THE AMERICAN MEDICAL ASSOCIATION; MEMBER OF THE MASSACHUSETTS  
MEDICAL SOCIETY; FELLOW OF THE AMERICAN ACADEMY OF MEDICINE,  
BOSTON GYNECOLOGICAL SOCIETY, ETC.

[Reprinted from the *Transactions of the American Medical Association*, 1879.]



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HOUGHTON, OSGOOD AND COMPANY.

## ASPIRATION OF THE KNEE-JOINT.

By HENRY O. MARCY, M. D.,

CAMBRIDGE, MASSACHUSETTS.

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THE landmarks of our fathers in surgery have become of small value in these days of careful inquiry and patient research, of radicalism and reform. Little respect is now paid to dogmatic teaching. Old truths are reëxamined, sifted from error, and associated with new facts in such a way that new teachings are evolved, and the "thus far and no farther" of even our student days is no longer heeded. A learned bookseller of Berlin once replied to my inquiry as to why he did not keep medical books that "You doctors burn your books every ten years, and I cannot afford to keep such perishable property." May we not accept it as a compliment to the progressive spirit of our profession?

Until recently the peritoneum was held sacred from the ante-mortem touch of the scalpel; yet to-day it is subject to surgical manipulation almost without fear, and, with proper care, without serious danger.

Most of us were taught that accumulations of fluid in the pleural cavity should not be surgically inter-

ferred with; and our honored ex-president, Dr. H. I. Bowditch, of Boston, to whom I am under greater obligation than to any other as the master of my pupilage, was subject to criticism and reproach, indeed, almost ostracized by the conservative leaders of the Boston profession, for believing these fluids could be withdrawn with benefit, and daring to put his theories to the practical test. Ten years ago, when a student in the wards of Professor Frerichs, of Berlin, I told him of the large experience and surprising results obtained by the withdrawal of fluids by the use of the Bowditch and Wyman instrument; he went before his class and lectured for two hours, reviewing the entire subject, with its history from the ancients to the present, but ended as he commenced, by saying it was a *schwerer Frage*, — a most difficult question.

The instrument of Dieulafoy, with its finer needles and exhaust bottle, opened up greater possibilities, and avoided many dangers, in the evacuation of fluids from closed cavities. This, seconded by the enthusiastic and indefatigable spirit of its inventor, called the attention of the profession, all over the world, to the advantages of the new instrument, and placed it in the hands of a large proportion of surgical practitioners. With it new experiences have arisen, and naturally its use in the synovial effusions of the joints was suggested, especially that of the knee so long and familiarly known as “white swelling.”

The surgical experience of two thousand years had taught the extraordinary danger to limb and life of injuries to the knee-joint which opened its cavity,

and no one principle in surgery had been better settled, for many generations, than that of non-interference with the accumulations of fluid within the joint. Under the influence of such conservatism, it is no wonder that the question is still *sub judice*, and that many of our wisest and best surgeons yet believe that medical and external applications are the only advisable means to be employed in the treatment of such affections.

Owing to the novelty of the question, not much has been written upon the subject. Prompted by my own experience, on the 1st of April of the present year, I addressed one thousand circular letters to the surgical profession of America, hoping, by multiplied experiences, to aid in settling a question of so much importance, and, if treatment by aspiration is advisable, to define its limits and possibilities. I wish at the beginning to thank the members of our profession for the very general interest shown in the investigation, and for the valuable material placed by them at my disposal.

Influenced by my previous teaching, I had never used the aspirator for the removal of fluids from the knee-joint until February, 1875, although I had long regarded the instrument as one of my most valuable aids in surgery. Since that time I have treated fourteen joints and aspirated forty-seven times in twelve cases. The histories I will briefly reproduce here.

CASE I. J. C., aged thirty-four, married. When a soldier in the English army he contracted gonorrhoea, from which a stricture resulted. A fresh gon-

orrhoea was followed by an attack of inflammation of the joints, and a sudden enlargement of both knees with fluid. The pain from distention was so great that very large opiates gave little relief, and I feared the most serious consequences from the violent inflammatory symptoms.

None of my medical friends could aid me by their experience, and I found only the following brief note in Bryant's Surgery: "Paracentesis of the joint is an operation that has been performed, and, in the hands of some surgeons, with wondrous success. Dr. Foyrer, of Calcutta, is one of its strongest advocates, having shown that, in the chronic and subacute forms, much good is often obtained by the operation, if care be taken to exclude the air by carefully closing the puncture and fixing the joint on a splint. The drawing off of the fluid affords instantaneous relief. I have performed this operation once, with a good result, in a case in which tension of the joint was extreme; and in another case, operated on by Mr. Cock, a similar result was obtained. It is a practice, however, that ought to be followed with extreme caution."

I ventured to aspirate first one joint, and with such relief that the patient demanded that the other should be tapped. The temperature immediately fell, the pulse lowered, and sleep followed. The effusion, however, quickly returned, the pain from distention was as great as before, and I was besought to remove the fluid, which I did thirty-six hours after the first operation. The liquid withdrawn was of the same character as at first, — serous, showing micro-

scopically a few exudation-corpuscles and blood-cells. On the third day the operation was again repeated; and lastly, six days later, being eleven days from the first tapping, when the secretion suddenly ceased. By the twenty-first day from the first operation the patient was convalescent. He could walk without much lameness, had good flexibility, and no relaxation of ligaments. He was soon at work, and has continued until now as well as before the attack.

The quantity of fluid was, from over six ounces at first aspiration, reduced to four at last aspiration, and the amount removed from each joint was from twelve to fifteen ounces. Considering the cause, character, and severity of the inflammation, I could but conclude that the result was remarkable, and largely to be attributed to the means employed.

CASE II. Acute rheumatic inflammation of one knee. Three ounces of serum were removed. No reaccumulation of fluid, and the patient was speedily convalescent; result perfect.

CASE III. Acute rheumatic inflammation of one knee. Twice tapped, January 31st and February 7th. Plaster splint. Fluid did not reaccumulate; convalescence rapid; result perfect.

CASE IV. Acute gonorrhoeal. Patient had previously had a severe attack of gonorrhoeal rheumatism, and recovered with a weak knee, internal lateral ligaments relaxed, and the limb bent inwards. Aspirated twice, and immovably fixed in plastic splint. Recovery slow; the joint much as before the attack, — weak, and mobility limited.

CASE V. Traumatic — fractured patella. Fluid bloody. Plaster splint. Fluid did not reaccumulate.

CASE VI. Acute inflammation. C. S., aged thirty-six, previously healthy. Seized with a chill June 28, 1878. Pulse 112; temperature  $103^{\circ}$ ; left knee joint intensely painful; almost no sleep since attack. Seen on the 30th. Aspirated five ounces and two drachms of clear serum, exhibiting microscopically a few exudation-corpuscles and blood-cells. At once applied a plastic splint, extending from toes to groin, with wide fenestræ over knee. Opiates. Reaspirated as follows:—

July 1,	6 ounces 2 drachms.			
" 2,	5 "	6 "		
" 3,	3 "	3 "		
" 4,	4 "			
" 5,	4 "	1 "		
" 6,	3 "	1 "		
" 7,	3 "	4 "		
" 8,	5 "	slightly purulent and somewhat bloody.		
" 9,	3 "	6 drachms.		
" 10,	3 "	6 "		
" 11, A. M. 2	"	4 "	specific gravity 1040.	
" 11, P. M. 2	"	6 "	" "	1012.
" 13,	1 "	4 "	" "	1016.
" 15,	4 "	1 "		
" 16,	3 "			
" 18,	3 "	4 "		
" 20,	1 "	4 "		
" 23,	2 "			
" 29,	2 "			

In all nearly seventy ounces removed in thirty days. During this entire period absolute rest was enjoined, the ice bag was continued most of the time day and night, leeches were freely used, and iodide of potassium, bark, and opium taken internally. The temperature varied, but was continuously above the normal, usually from  $100^{\circ}$  to  $102^{\circ}$ ; the pulse corresponded

with the temperature. The patient was a very intelligent man, of decided will; and the relief which he experienced from aspiration was so great, that my only difficulty was in prevailing upon him not to have the operation repeated oftener. My careful study of the character of the fluid, together with the fact that usually both temperature and pulse fell after aspiration, led me to feel safe in repeating the operation frequently, and also convinced me that the quantity of fluid was one of the important factors in the production of constitutional suffering.

The secretion of fluid ceased quite suddenly, and rapid improvement followed. A considerable degree of stiffness remained for some weeks, and a few adhesions were broken up under ether. Convalescence went steadily on, and for some months the flexibility of the knee has been quite equal to that of its fellow, and the articulation perfect.

CASE VII. Septic poisoning. Fluid slightly purulent; three times aspirated. Plaster splint. Knee improved, and fluid ceased to accumulate, while disorganization and disarticulation of the hip-joint of the same side went on *pari passu*.

CASE VIII. Acute gonorrhoeal rheumatism. Twice aspirated; recovery slow.

CASE IX. S. W., aged twenty-three. Family healthy, and he was strong until after graduation in 1876. In July his left knee was acutely inflamed, with a marked effusion. In 1877 right knee, both elbow-joints, and several of the phalangeal articulations were involved, with effusion. He was under the best of general care, taking a trip to the Azores, etc.,

without much improvement. Limbs weak, lateral ligaments relaxed. Both knee-joints were aspirated March 7th: left knee, three and one half ounces of pale fluid, specific gravity 1016, with a few exudation-corpuscles; right knee, three ounces, containing also a few blood-cells. Plaster splint on left limb, Martin's elastic bandage on right. Reaspirated April 15th and 30th; slow improvement; has been allowed to resume a part of his duties as a teacher, but is still under treatment.

CASE X. Inflammatory, of six months' standing. Aspirated three times within a month. Plaster splint. Convalescent in six weeks; patient at work, with free movement of the articulation.

CASE XI. Acute inflammatory. Recovery rapid after a single aspiration.

CASE XII. Acute rheumatic inflammation; one aspiration; recovery rapid.

I have used the aspirator as made and essentially modified by Codman & Shurtleff, of Boston. This instrument is to be commended for its careful workmanship, simplicity, and the ease with which it is kept in reliable order. Of all the aspirators which I have seen, either American or of foreign manufacture, I believe this decidedly the best. With one exception, I have used the No. 1 or smallest-sized needle.

The following are the reports of cases received in answer to my circular above mentioned:—

DR. WILLIAM INGALLS, of Boston, has operated in eight cases: five acute, from injury, and three chronic; with fourteen aspirations, twelve in the hospital and

two in private practice. Treatment: rest; hard splints; in three cases dry sponges were applied after the aspiration, with bandages over and water to sponges to make them swell, thereby securing uniform compression; in one case extension was used. Opinion: "Favorable to the operation. Almost all cases present a condition which seems to demand a release of fluid by some means. My case in private practice, three and one half years ago, was that of a lady who had been very fond of dancing and walking much. Both knees. I had reason to suspect erosion of cartilages, but think now I was mistaken, as she can walk two hours without a cane. About two years ago, there was evidence of fluid in both joints; aspirated, compression, moderate extension. Three ounces of serum were taken from one knee, one ounce from the other."

The following were hospital cases:—

CASE I. E. P., aged sixteen. Acute synovitis. Entered April 30, 1875. Aspirator needle passed into knee May 2d; one ounce of serum withdrawn. Swelling did not reappear. Well May 17th.

CASE II. T. B., aged thirty-five. Acute synovitis of knee. Entered April 21, 1875. Knee aspirated on the 25th; two ounces of purulent serum. Swelling returned; knee reaspirated May 18th, but no fluid obtained. Swelling diminished, and patient discharged, relieved, May 28th.

CASE III. J. C. Subacute synovitis of knee. Patient entered May 12th, having been kicked by a horse. Aspirator needle passed into knee May 14th; four ounces of sero-sanguineous fluid withdrawn. Patient discharged, well, June 3d.

CASE IV. 1879. An old gentleman, with chronic enlargement of left knee. Aspirator needle passed on outside, with no result; on inside, two ounces pus with serum. Patient still under treatment.

CASE V. J. H. Acute synovitis from injury. Entered April 12, 1877. Knee aspirated on the 16th; four ounces reddish serum withdrawn. Reaspirated April 20th; four ounces again. Discharged, relieved, May 24th.

CASE VI. J. F. Entered July 11, 1877. Chronic synovitis of knee. Aspirated on the 12th; four ounces of serum. Discharged, well, September 15th.

CASE VII. T. H. Acute synovitis of knee. Entered June 25, 1878. Aspirated on the 27th; two ounces of sero-purulent fluid; reaspirated the 30th; three ounces more fluid withdrawn. Discharged, relieved, August 5th.

Dr. A. J. Fuller, of Bath, Maine, reports five cases, with six aspirations. Cases mostly from injury and inflammation following. In all cases but one, the fluid withdrawn was pale yellowish serum, varying in quantity from one to four ounces. Treatment, rest and absorbent remedies. In the case of reaspiration, there were three ounces of serum; result, favorable, with slight stiffness for a few months. The period of recovery varied; generally, the use of the limb quite satisfactory.

“I should recommend aspiration when other treatment failed to produce the required result. Should prefer those cases where the trouble was the result of accident. I feel safer with aspiration than with any other method; still, think it should be practiced

with caution, as inflammation might result in permanent injury to the joint."

Dr. N. Senn, Milwaukee, Wis., reports six aspirations in five cases, — one of acute synovitis, one rheumatic, and three inflammatory. From one to four ounces of serum taken. Treatment, rest in fixed position, pressure by elastic bandage or adhesive straps, and, later, massage and passive motions. Results, in old cases of long standing some stiffness, but in none ankylosis.

"I think aspiration one of the most useful operations in chronic effusions, in acute cases where pain is not controlled by usual treatment, and in subacute chronic cases which do not yield to absorption. In suppurative synovitis, I consider aspiration only useful for its diagnostic value.

"Have reaspirated in some instances several times, but fluid reappeared. In these cases, I prefer an incision and drainage under antiseptic spray and dressing."

Dr. H. B. Whiton, of Troy, N. Y., has aspirated five times in four cases, — two traumatic and two inflammatory. Duration of one year to eighteen months in three cases, and of but one month in one case. Quantity of fluid one half ounce to six ounces, synovial and muco-purulent. Treatment, rest, blistering, and iodide of mercury. Reaccumulation of fluid in one case, from overwork, after a period of nearly one year. Reaspirated, and withdrew one ounce of fluid. Cure complete, and in all cases a perfect joint.

"I should always advise aspiration whenever I could have absolute command of the patient, to

secure a complete rest. I would not limit the operation, except in cases of extreme feebleness, and associated with constitutional disease of an aggravated type. I consider it just as safe to aspirate the knee-joint as to aspirate the bladder or pleural cavity."

Dr. Wm. M. Fuqua, of Hopkinsville, Ky., has operated twice by aspiration, and twice by incision. Three were traumatic cases, one resulting from erysipelas. Fluid withdrawn, from eight ounces to three drachms of healthy serum. Coöperative treatment, extension by weights, fomentations, elastic bandage, rest, and immobility — by splint — if required. Convalescent in about thirty days. Subsequent condition good; limb safe; flexibility impaired, yet locomotion well performed.

"I would advise always to remove imprisoned fluid by aspiration, if possible. I do not fear atmospheric air. The aspirations, to do good, must be done early. I would not limit the operation to any class of cases. Passive motion was used just as early as the cases would admit of it. When the joint was opened by incision, carbolic-acid solution was used once daily. Patient was sustained by good diet, and stimulants, if required; opium at night; and supported by pretty firm bandage, — elastic, if preferred.

"This is surely an important subject. When I first dared to open the knee-joint, my medical brothers were appalled, and aspiration of the hip-joint was regarded in the same light. Is it not our important duty to give an outlet to pus in lumbar and psoas abscesses also?"

Dr. G. E. Center, Evansville, Indiana, reports four cases, two of which are traumatic. Quantity of fluid from one to four ounces, purulent, with blood. Treatment, rest, starch bandage, opium, iron, and quinia. Convalescence in from two to twelve weeks. The joint useful; in one case the ligaments contracted, and tenotomy was performed; the other three cases all right, — all flexible; in one the usefulness of the limb impaired for two months.

“ I think the operation advisable, — nothing equal to it in effusion of the knee-joint. Before I had an aspirator, I was called forty miles to see a man, aged twenty-eight, with synovitis of the joint. Patella was raised up, and there was fluctuation. With a sharp-pointed scalpel I made a free incision at the lower and inner side of the patella. Evacuated three ounces of pus, and two of blood and pus. Then I removed the scalpel, which had a small octagon handle, passed it into the wound, and could see and feel it pressing out the skin on the opposite side. Gave him a small glass syringe, and a five per cent. solution of iodine in water to inject twice daily; also, gave tincture of chloride of iron and quinine. Within two months he had as perfect use of the joint as before the injury.

“ I have aspirated pericardium twice, brain (hydrocephalus) twice, pleural cavity and abdomen often.”

Dr. F. P. Porcher, of Charleston, S. C.: “ I have aspirated three times in two cases, — one traumatic, one rheumatic. There was considerable distention. Fluid considerable in quantity, of sero-albuminous character. Swelling reappeared in one case, in about twenty-five days after aspiration; reaspirated once and cured.”

"I am very favorable to aspiration in all cases where there is an accumulation of fluid of almost any description. Aspirated once for pericardial effusion, four times in pleuritic effusion."

Dr. J. S. Buist, Charleston, S. C. : "I have aspirated four times in three cases, — two traumatic, one inflammatory and rheumatic. Fluid taken, from six drachms to one half pint of serum. First case of six months' duration, second nine, and third six months ; and, in all, distention considerable. Treatment, rest, plaster-of-Paris bandage, and large doses of iodide of potassium and iron. In the first case there was a complete recovery, but in the other only partial.

"I think the operation eminently proper, and that it should be practiced in all cases from mechanical injury. Rest after aspiration is a *sine qua non*, — plaster-of-Paris bandage extending even to the hip-joint."

Dr. R. Reyburn, Washington, D. C., reports two cases, with three aspirations: one case acute traumatic, and one rheumatic. Fluid synovial. Treatment, rest and iodine. In the first case accumulation reappeared ; reaspirated, with most excellent results. The first case was restored in six months, with slight ankylosis ; the other was slightly stiff at first, but good use of limb finally resulted.

"I consider aspiration one of the greatest advances of modern surgery, and applicable in all cases except where there is very evident acute inflammation of the joint, when I would wait a little, until the inflammation had obtained its maximum and the joint was well filled with fluid."

Dr. J. P. Thomas, Pembroke, Ky. Six aspirations in three cases, — two traumatic and of four weeks' duration, one rheumatic and of only one week's duration. In the first case, before bandage was applied, there was reaccumulation twice, within a week each time; but, after equable compression, there was none. Reaspirated first in ten days, then in twelve days. The first case recovered in three months; was not retarded but benefited by the aspirations, and good use of joint was secured.

"In any case of extreme effusion of traumatic origin, I would aspirate the joint. In cases of rheumatic or syphilitic origin, I would delay, but if other measures failed would not hesitate. I believe the early resort to the operation prevented the absorption of the tissues and consequent effusion of plastic matter in the fluid, and to have waited in these cases for the process of absorption would have resulted in complete ankylosis of the articulation. This may be an error, but certainly there would have been great injury to the ligaments and consequent flexibility of limb. As it was, there was no impairment of usefulness. The bandage, when properly applied after aspiration, I believe will prove sufficient to prevent any reaccumulation. I have had no experience in aspiration of any but the knee-joint, but should not hesitate in any joint not quickly yielding to absorbents with proper compression."

Dr. Thomas H. Burchard, of New York, reports the following cases: —

CASE I. H. M., American sailor. Entered Bellevue Hospital, May, 1872. Had an attack of acute articular

rheumatism in India two years ago, following a gonorrhœa. Since well, until three weeks before admission. Inflammation developed suddenly upon the arrest of a gonorrhœal discharge, which was very purulent, and had continued for two weeks. Patient was suffering severely with a greatly swollen joint. Pulse 104; temperature  $103\frac{1}{2}^{\circ}$ . Patient was discharged unrelieved, refusing aspiration of the fluid, which had been advised by Dr. Sands, visiting surgeon. Dr. Burchard was summoned the day following, and, introducing the No. 3 needle of the Dieulafoy instrument, removed four ounces of fluid. Immediate relief followed. The next day reaspirated six ounces. Treated with tincture of iodine and bandage, with compressed sponge. In four days there was no reaccumulation of fluid, and in two weeks he returned to service.

CASE II. June, 1876. Male, aged twenty-five, American. Gonorrhœal synovitis. Effusion occurred four weeks since, following debauch. Had taken large doses of morphia, with no sleep for fifty hours. Aspirated six ounces of fluid; cotton-wool compress and bandage, the patient falling asleep while the bandage was being applied. Narcotism developed with alarming symptoms. Respiration fell to four a minute, and the patient was restored with difficulty. There was no reaccumulation of fluid, and the patient was out in ten days, wearing an elastic knee-cap.

CASE III. Synovitis of the left knee-joint, following phlegmasia alba-dolens. September, 1878. Suffered from a previous attack in 1875. Right joint measured  $11\frac{1}{2}$ , left joint  $14\frac{3}{4}$ , inches. Aspirated four

ounces of fluid, and applied plaster-of-Paris splint. January 4th splint removed, and patient discharged, cured.

Dr. Burchard also reports one case of aspiration of the pericardium, followed by relief.

Dr. Thomas M. Flandrau, Rome, N. Y., reports two aspirations in a case of pyæmia following otitis, in a man sixty years of age. Two or three weeks' duration; joint very painful, and considerably distended. Withdrew nearly one half pint of thin pus. Reaccumulation in one week; reaspirated, and withdrew six ounces of pus as before.

"I should repeat the operation under similar circumstances. I have freely opened the knee-joint in a case of acute traumatic synovitis, with a large discharge of pus, and immediate relief of violent symptoms that threatened early death. The patient recovered, and has an excellent limb."

Dr. Moses Gunn, of Chicago, Ill., reports one case of purulent effusion into the knee-joint, treated by aspiration. Removed four or five ounces; twice reaspirated; each time fluid less purulent and in less quantity. Recovery perfect.

Dr. J. J. Caldwell, of Baltimore, Md., has aspirated in two rheumatic cases of over a year's duration. Fluid synovial, straw-colored. No reaccumulation. The joints gradually reduced in size, and recovery good.

"I regard aspiration as the best method of treatment offering itself in the present status of surgery, and consider the operation one of the greatest advances of modern times."

Dr. R. A. Kimball, Charleston, S. C., has twice as-

pirated in one traumatic case of many months' duration. Withdrew about six ounces of fluid. Absolute rest enjoined, and plaster-of-Paris bandage applied after aspiration. There was reaccumulation after removing bandage. Reaspirated, and bandage again applied for three weeks. Result good.

"I think the operation should be recommended where there is a simple effusion in a chronic state, with no evidence of disease of bone or cartilage, nor great thickening of synovial membrane."

Dr. J. E. Mumford, Princeton, Indiana, reports one case, of traumatic character. Withdrew two ounces of serum, with flakes of lymph; then treated with pressure and bandage. After the operation there was steady improvement until entire recovery; functions of the joint not in the least impaired. "I shall certainly avail myself of the operation hereafter in the treatment of synovitis. I am much pleased that there is a prospect of having the matter presented to the profession."

Dr. S. B. Ward, Albany, N. Y., reports two cases, one of which was traumatic, the other rheumatic; the first of five months' duration, and the second of two months'. In the first case three ounces of fluid were taken; two ounces of clear, straw-colored serum from the second case. Treatment, rest, elastic pressure with rubber bandage. Slight reaccumulation, but gradually disappearing. Recovery, with both joints flexible and apparent complete usefulness of limb at the end of two months, in both cases. His opinion is favorable to the operation.

Dr. D. Scofield, Washington, Iowa, reports one case

of traumatic inflammation, of three months' duration. "I withdrew three to four ounces of fluid; then used compression, and iodine applied locally. I would advise aspiration where the fluid is not purulent, and the distention is pronounced."

Dr. W. S. Duncan, Brownsville, Pa., reports two cases and four aspirations. Withdrew three ounces of yellowish, non-transparent serum; then used splints, with rest and laudanum, quinine and iron internally. There was a reaccumulation of about three ounces in three weeks. Reaspirated, in four weeks, about three ounces of purulent fluid; three weeks after, two ounces of serum, with a little pus. The splint was kept on about a month after the last aspiration. Perfect use of the joint resulted. "In another case a horse fell on a gentleman's knee. I aspirated, taking four ounces of bloody serum from the joint. Kept him quiet two weeks, when he returned to his business. I would aspirate any joint containing fluid, if I thought there was danger of serious injury to the cartilage or bone."

Dr. H. A. West, Galveston, Texas, reports one case, of traumatic character, and from two to three months' duration. A large quantity of thick, clear, straw-colored fluid was withdrawn. The after-treatment included rest, blisters, and iodide of potassium. The case recovered, with an excellent condition of the joint, in about three weeks.

"I can see no reason why aspiration should not be resorted to in effusions of the joints as well as in other conditions. It is certainly more effective and more rapid than the local or internal use of remedies to promote absorption."

Dr. G. B. Bullard, St. Johnsbury, Vt., reports one case, traumatic, of three months' duration. Withdrew four ounces. Rest. In three months limb restored to usefulness by passive motion. He would advise the operation whenever certain that the joint contains fluid which will flow through a small aspirator needle.

Dr. Weir, of New York city, reports three aspirations in two cases, — one traumatic, one sero-purulent. "In the first case there was a reaccumulation, and I reaspirated; suppuration ensued, and death followed. In the second case there was a perfect recovery. I think well of the operation, but aspiration, in obstinate and rapidly progressing synovitis, should be associated with antiseptic precautions."

Dr. Sabine reports two cases at St. Luke's Hospital, and Dr. Bell two cases at Chambers Street Hospital, but their histories were so imperfectly taken as to be of no value.

Dr. G. H. Gray, Meriden, Conn., reports one case, of syphilitic character, still under treatment. "Have withdrawn two ounces of thick pus, of a greenish color. In this my first case of aspiration I cannot profess to offer any experience of value; can at present only say that my case is doing well. I have seen the operation performed in the London and Paris hospitals, but with what permanent results cannot say."

Dr. J. M. Sharkey, San Francisco, Cal., reports one case, inflammatory, of six months' duration. Withdrew a large quantity of synovial, semi-opaque fluid. Convalescence took place in about four weeks; joint

weak several months. He would not advise aspiration unless other remedies failed.

Dr. J. T. Hodgen, St. Louis, Mo. : "I can only say, I have aspirated the knee-joint repeatedly, always for a subacute, non-traumatic synovitis. I have never had an accident or bad result, but have not kept a record of cases."

Dr. C. K. Thompson, Wellsboro', Pa. : "I have never aspirated in synovitis, but shall do so the very next opportunity that occurs."

Dr. H. I. Bowditch, Boston, Mass. : "I have no experience in such cases, but, *a priori*, with Dieulafoy's extensive experience, I see no reason why the treatment should not be employed."

Dr. W. P. Bolles, Boston, Mass. : "I am sorry that I cannot help you in the research. I believe it is a valuable method in many cases."

Dr. Henry A. Martin, of Boston, in his very valuable paper upon Surgical Uses of the Strong Elastic Bandage, published in the Transactions of the American Medical Association, 1877, referring to the use of elastic compression constantly applied to synovial effusions, adds, "I have been recently in the habit of aspirating the synovial sac before applying the bandage, and I have never known a case in which this was done in which the effusion returned. I have treated several such cases by aspiration and the subsequent constant use (night and day) of the bandage for at least six weeks, and with complete success."

Dr. I. H. Chatham, Seymour, Indiana, writes: "I have never aspirated, but shall do so when an oppor-

tunity occurs. I deem it very important as a means of diagnosis, and in many cases the safest and most successful method of treatment. My experience is not sufficient to give an opinion as to the limit to which aspiration may be used in the removal of pathological fluids, with safety; but I have aspirated successfully for nephritic and psoas abscess, strangulated hernia, retention of urine, ovarian cysts, and dropsy of the abdomen, and I must say my experience has been highly satisfactory in every instance."

Dr. R. M. Todd, Indianapolis, Ind.: "I have never performed the operation, but have no doubt that it will prove as efficient in these cases as in effusions elsewhere. The injury constantly wrought by the pressure of abnormal fluid we know to be disastrous. I regret I have no clinical experience to give you."

Dr. William Lomax, Marion, Ind., writes: "I once incised the knee-joint in a case of injury from a pistol-shot. Withdrew probably one ounce of synovial fluid and blood. Then I fixed the limb upon a long splint as much elevated as could be borne; applied cold water freely. Convalescence took place in about two months; joint ankylosed for a time, but recovered good motion ultimately. I am favorable to aspiration in good constitutions."

Dr. Lewis A. Sayre, of New York city, writes: "I have had no experience in aspiration of the knee-joint. Have frequently opened the joint by a free incision in cases of chronic effusion or suppuration, and always with good results. In fracture of the patella accompanied by great effusion, I should aspirate, in order to bring the protruded bones together;

and in large synovial effusions that could not be absorbed the aspirator is useful; but in purulent collections there are often such large flakes which cannot escape by the aspirator that I prefer incision."

Dr. W. S. Thorne, San Jose, Cal.: "I believe the operation dangerous and unnecessary in ordinary synovitis. I think it should be limited to those cases of purulent synovitis that have resisted all other methods. I consider aspiration unwarranted in the treatment of serous synovitis: *first*, because a large number of accidents to life and limb have resulted from its use; *secondly*, its reputed and most authentic results compare unfavorably with the method of immobility with pressure. Perfect and absolute rest, with bandages applied as closely as the circulation will tolerate, equably and conformably maintained, will, after the acute stage has been subdued by the ice-bag, give perfect results in a vast majority of cases."

I have contented myself with quoting freely from a review of the foreign literature upon the treatment of effusions into the knee-joint, published in the "Boston Medical and Surgical Journal," by Dr. E. H. Bradford, of Boston:—

Dieulafoy reported, one year since,<sup>1</sup> that he had aspirated the knee-joint two hundred times. He believes the operation is a rational and efficient one in a large class of cases. He uses the No. 2 needle, first placing a rubber bandage around the knee, leaving uncovered the place of puncture. His point of

<sup>1</sup> Gaz. des Hôpitaux, May 18, 1878.

election is the external cul-de-sac of the joint, on a level with the upper border of the patella and about two centimeters outside of this bone. Compression is used as soon as the fluid is evacuated, by a flannel bandage applied from the foot up to the thigh. This is removed in twenty-four hours, and, if fluid has collected, it is reaspirated.

The number of aspirations needed varies greatly. Bloody and other effusions into the joint following external injury usually disappear rapidly, and require but one or two aspirations before a cure is effected. Sero-fibrinous exudations (hydrarthrosis) vary in the number of aspirations from one to six, but, though the treatment is long, the time before recovery is certainly shorter than that during treatment in any other way. Blennorrhagic hydrarthrosis is much more obstinate than any other form. More aspirations are needed before recovery, and the exudation returns quickly.

Scriber, of Baden, advises incision and drainage of the knee-joint in chronic serous inflammation; in chronic disease of the knee-joint with granulation, where there is effusion and no caries; in acute purulent affections of the joint with evident fluctuation; and in acute serous effusions, when the pain is so severe as to exhaust the patient. Incisions are to be made on both sides of the patella, and a thick drainage-tube is inserted; before the insertion of the tube, the joint is to be washed out with a solution (two and a half to five per cent.) of carbolic acid. In chronic cases, if there are sinuses and fetor, a solution of chloride of zinc (twelve per cent.) is used

instead. The operation is to be done with the strictest antiseptic precaution. In acute cases the tube should be removed in three or four days if the wound is sweet. If the secretion does not diminish quickly, the joint should be washed out again, but the tube should not be left longer than ten days, for fear of irritation of the cartilages. In chronic cases, however, the tube may be allowed to remain for twenty to thirty days. The number of cases reported as treated in this way is six. No evil result took place in any of the cases, and the recovery is said to have been complete. Where there is caries of the bone present, it is the opinion of Scriber that excision offers the readiest method of treatment.

Heinecke,<sup>1</sup> however, reports two unusual cases, where the joints were incised antiseptically, and a sequestrum and disease of the tibia were found; the sequestrum was removed; the diseased bone was chiseled out and scraped away. Recovery with some motion ensued in both cases. Heinecke cites, as examples of the advantage gained from the use of antiseptic precautions, ten cases of affection of the knee-joint treated in the Magdeburg Hospital, where the knee-joint was incised and washed out. In all but two the joint was opened under spray. In two the opening was caused by a wound, but the joint was washed out with antiseptic solutions and treated antiseptically. In seven cases the result was cure, with the establishment of perfect motion. In three suppurative knee-joints (two, the above-mentioned joint affections complicated with necrosis of the tibia) there

<sup>1</sup> *Deutsche Zeitschrift für Chirurgie*, 1878, 10th Bd., p. 296.

was only limited motion on recovery. Of the seven entirely successful cases, one was an acute serous inflammation, one hydrops articuli fibrinosus, one sanguineous effusion, three were punctured wounds of the knee-joint, one was the removal of a loose cartilage from the joint.

Schüller reports<sup>1</sup> two cases of antiseptic incision and drainage of the knee-joint, one in a case of chronic synovitis with sero-purulent exudation. Recovery followed, but details are not given. A second case was one of acute suppurative inflammation of the knee-joint following an attack of erysipelas. The patient died in fourteen days.

Rinne<sup>2</sup> reports eleven cases of knee-joint affection tapped with a trocar, and washed out with a three per cent. solution of carbolic acid. Of these eleven, in five there was no reaction after the surgical interference; in four there was slight fever and a temporary return of the fluid. Nine are reported to have been completely cured, apparently with recovery of motion at the joint; one died of tuberculosis; one was improved, but was unable to walk without the help of a stick.

One fact will readily be admitted: that experts in antiseptic surgery are much more bold, and claim better results than other surgeons. Ranke's statistics, read before the General Congress of Surgeons,<sup>3</sup> show unusually good results, which are attributed by the writer to antiseptic treatment. Out of seventeen

<sup>1</sup> Deutsche Med. Woch., November 24, 1877.

<sup>2</sup> Centralblatt für Chirurgie, December 8, 1877

<sup>3</sup> Ibid., Bd. 29, p. 480, 1878.

cases of open wounds of the larger joints, fourteen recovered, with motion at the joints, both in cases where there was injury to the bone and where there was none. In the three which recovered with ankylosis, the patients did not come under treatment until after suppuration had become established. In no case did death follow.

Schüller, in his report of the surgical clinic at Greifswald, gives the results of twenty cases of knee-joint affections treated by Hueter's method of injection (with a subcutaneous syringe) of a solution of carbolic acid (two to three per cent.). The injection is made either into the thickened capsule, or into the granulations on the extremities of the bones forming the joint. It is reported to have been particularly useful in serous and sero-fibrinous effusions. In such cases, more was gained in days and weeks by the injection than by months of other treatment. Of the twenty cases of knee-joint disease treated in this way (five serous and sero-fibrinous synovitis, two hydrops articuli, two chronic arthritis, eleven fungous synovitis), improvement is noted in all of the cases, except two; of these, one died of erysipelas, following the prick of the needle, and the other underwent excision. The method is not considered applicable in purulent synovitis.

Thus it will be seen that many of the leading European surgeons are much more bold in the treatment of diseases of the knee-joint than are those of our own country.

The clinical histories of fifty-six cases, reported

by twenty-three surgeons, which are incorporated into this paper, added to my own, make seventy cases, seventy-five joints aspirated, in all, one hundred and twenty-four times, the quantity of fluid varying from one half ounce to eight or more ounces. The character of the fluid was serous, sero-purulent, and sero-sanguineous. The causation in one case was syphilitic, in two cases septic, in three gonorrhœal, in four chronic inflammatory, in eight rheumatic, in ten acute inflammatory, in twenty-three traumatic, and in eleven not specified. In my own cases, the quantity of fluid varied from one and a half to six and a half ounces; specific gravity from 1012 to 1040. The average quantity was about four ounces, and the average duration of treatment was four weeks. Nearly all the cases are reported as excellent in result, with perfect use of limb; two or three as fair or improved; and only one death is reported, in which suppurative inflammation followed.

As will be seen by a careful study of the cases given, the conditions under which surgeons have feared to operate are those very ones where the most brilliant and satisfactory results have been obtained, namely, in acute inflammatory and traumatic cases. This is contrary to the advice of nearly all writers whom I have consulted; and yet, when we reflect upon the conditions present, we should expect, *a priori*, that this would be the series most benefited, and that temporizing would result most disastrously. Time is not allowed me to enter into a careful discussion of this important question.

It is well known that the differences between the

synovial and serous membranes are not very great. The innermost layer of the synovial membrane is completely invested with nucleated cells. Over extensive portions of the membrane, in silver preparations, two series of tracings are detected. The upper layer corresponds quite closely with the outlines of the endothelium. The underlying layer shows the characteristic vascular net-work, with long rhomboidal and square meshes, the serous canaliculi being intermediate. Böhm claims to have shown that the blood-vessels open into and actually communicate with the serous canaliculi. Hueter asserted that he had never observed such conditions, except in inflammation, when the tension of the sub-synovial lymph paths was considerably increased; while Landzert, by employing his silver method, brings the lymphatics here into distinct view.

It is not difficult to picture the histological changes which are produced in acute inflammation. The serous exudation, the capillary injection, the venous stasis, are the first factors which, unrelieved, rapidly go on to produce pathological results that have long been known to the profession as among the most disastrous in surgery. Under the pressure and inflammatory changes, softening of the synovial membrane may, and probably in most instances does, take place. The cartilages and osseous structures readily become implicated, and their integrity impaired, while the ligaments themselves are so often involved in these disastrous changes that Mr. Paget selects them as an illustration of the effect of inflammatory softening, such as permits that great yielding of them "which

we almost always observe in cases of severely inflamed joints."

"We may see such changes in the ligaments of all joints, but we examine the effect of this softening best in diseased knee and elbow joints. The ligaments, softened during the inflammation, yield to the weight of the distal and unsupported part of the limb, and the joint is disturbed. Then, if the inflammation subsides, and the normal nutrition of the joint is restored, the elongated ligaments recover their toughness, or are even indurated by the organization or contraction of the inflammatory products within them. But they do not recover their due position, and thus the joint is stiffened in the distortion to which its ligaments had yielded in the former period of inflammation," and permanent disability results.

The lesson which the clinical testimony of this paper teaches is to operate early; reaspirate as often as the fluid accumulates; aid by rest, compression, and fixation of the joint. If thereby we can avoid, in large measure, such deplorable results as above pictured, and such as present themselves to the study of every practitioner of medicine, may we not feel that our profession has taken another step in the right direction, and, by the establishment of truth, added in some share to the Divinity of our Art?<sup>1</sup>

<sup>1</sup> Since the presentation of this paper in May, 1879, I have aspirated the knee-joint eighteen times, and twice injected and washed out the synovial cavity with carbolic acid. The results of this experience are entirely in accord with the deductions presented above. — H. O. M.

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THE  
UTRICULAR GLANDS OF THE UTERUS,

AND

THE GLANDULAR ORGAN OF NEW FORMATION WHICH  
IS DEVELOPED DURING PREGNANCY IN THE  
UTERUS OF THE MAMMALIA, INCLUD-  
ING THE HUMAN SPECIES.

BY

PROF. GIOVANNI BATTISTA ERCOLANI,

PERMANENT SECRETARY OF THE ACADEMY OF SCIENCES OF BOLOGNA: CORRESPONDING MEMBER  
OF THE ACADEMY OF MEDICINE OF PARIS AND BRUSSELS, AND OF THE  
GYNECOLOGICAL SOCIETY OF BOSTON, ETC.

TO WHICH IS APPENDED

HIS MONOGRAPH UPON THE UNITY OF THE ANATOMICAL TYPE OF  
THE PLACENTA IN ALL THE MAMMALIA, AND THE PHYSIO-  
LOGICAL UNITY OF THE NUTRITION OF THE FETUS  
IN ALL THE VERTEBRATES.

ALSO,

A GENERAL SUMMARY AND CLASSIFICATION,

WRITTEN EXPRESSLY FOR THIS EDITION.

*WITH A QUARTO ATLAS OF SIXTEEN PLATES,*

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THE HELIOTYPE PROCESS.

TRANSLATED FROM THE ITALIAN UNDER THE DIRECTION OF

HENRY O. MARCY, A. M., M. D.,

VICE-PRESIDENT OF THE AMERICAN MEDICAL ASSOCIATION; MEMBER OF THE MASSACHUSETTS  
MEDICAL SOCIETY; FELLOW OF THE AMERICAN ACADEMY OF MEDICINE,  
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## NOTICES OF THE PRESS.

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OF the many commendatory notices of the press the following are presented as embodying the opinions of medical and scientific men in reference to this excellent work:—

Among the many praiseworthy features of Professor Ercolani's work, we would first commend the tact with which he has avoided the error of too many investigators, that of hurling their processes and conclusions far above the heads of their readers. He, on the contrary, although dealing with a most recondite subject, has managed to present it in a shape to be comprehended readily by any well-educated physician. This is due in great measure to the clearness of his language, but certainly in no small degree to the fact that he leads up to his own observations by connected and critical *résumés* of the researches, deductions, and even conjectures of those who in the past have worked in the same field of inquiry. To have done this not only without prolixity, confusion, or unfairness, but with the result that we have mentioned, stamps him in itself as a great teacher. . . . We regret that we have not the space to summarize the observations and arguments which lead up to these conclusions, or to allude to the many matters of practical interest treated of incidentally in the work. We will mention, however, that the editor, Dr. Marcy, after briefly quoting the views of Aveling, Williams, and Engelmann on the menstrual changes that take place in the uterine mucous membrane, agrees with the last-named author, that that membrane does not behave in such an extraordinary manner as to destroy itself and be regenerated at every normal menstruation.—*The New York Medical Journal*.

The physiology of reproduction is one of the most interesting problems offered for solution to the scientist. In attempting to unfold the unity of the anatomy of the placenta in the mammalia, and of the nutrition of the embryo in the vertebra, a field of study has been entered upon which we think will unfold facts of rare interest.

In this brief review we cannot do justice to the value of the investigations of Prof. Ercolani. The results here unfolded need careful perusal and study, and if supplemented by experimental examination in the same direction, under the guidance of the facts and principles elucidated by these patient investigations, the student cannot fail to be profited thereby.

The atlas is a beautiful example of the accuracy of the process by which the glandular structure of the uterus and placenta is brought out. Every tissue is copied, the structure of important organs is illustrated, and parts hitherto veiled in mystery are clearly demonstrated.—*Buffalo Medical Journal*.

The medical profession is greatly indebted to Dr. Marcy for the opportunity offered by him for the perusal and study of the original investigations of the well-known Italian physiologist and gynæcologist. The translated work of Ercolani enriches medical literature on points of rare interest. Gynæcology has for some time run steadily in the direction of precepts for practice, and bold and startling methods of treatment. It is well once in a while for its devotees to pause and recollect that some portion of its work is associated with the study of the true physiology of the organs, which, when diseased, need its practical attention. Every gynæcologist should be a physiologist, and to each this valuable treatise, with its accompanying atlas, will be a guide to accuracy in uterine investigation, and a mine of information to the physiologist, and the medical practitioner as well. It is clearly written, well translated, and intelligible to every reader. Appended is the monograph of Ercolani upon unity of anatomical type of the placenta in all mammalia, and physiological unity of nutrition of the fœtus in all vertebrates.—*College and Clinical Record.*

The work of Professor Ercolani has been long known in its main features to those who have followed the researches which have been recently made into the structure of the placenta. The work before us contains the results of great research, both in the study and in the dissecting room. It gives a mass of information with respect to the views which have been hitherto held with regard to the uterine glands and placenta. It moreover brings prominently forward a subject which deserves more attention than it has hitherto received, that is, the part played by the glands of the uterus during pregnancy. The translation has been well made, and the publishers deserve the highest praise for their enterprising spirit in presenting this work to the profession.—*The London Lancet.*



